



STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

May 13, 1985

Mr. Ken Poulson
Brush-Wellman, Inc.
67 West 2950 South
Salt Lake City, Utah 84115

Dear Mr. Poulson:

Re: Mining and Reclamation Plan Review, Topaz Mining Porperty,
ACT/023/003, Juab County, Utah

The Division has completed its initial review of the permit application for the Topaz Mining Property (attached). This review is based upon information submitted to the Division by Brush-Wellman from 1977 through 1981, and upon conditions noted in recent site tours.

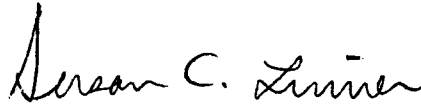
Division personnel would be glad to work with you in formulating a response to any of the review comments. Please format your response so that it references each Division comment by the appropriate Mined Land Reclamation Act rule number.

Due to the long expected mine life of the Topaz Mining Property, it is recommended by the Division that the operator file for a permit based on a 5-year term basis. This allows both the operator and the Division to review and revise the reclamation plan based on changes in the mining operation or to improve the potential for reclamation success based on new or proven reclamation practices developed during the permit term. A 5-year permit term will allow modification or adjustment of the surety amount to reflect such changes in the reclamation plan and to adjust the discrepancy between estimated inflation rate by revising the bond to current dollars.

Page 2
Mr. Ken Poulson
ACT/023/003
May 13, 1985

Please feel free to contact me for any clarification or assistance.

Sincerely,



Susan C. Linner
Reclamation Biologist/
Permit Supervisor

jvb

Attachment

cc: L. Braxton
D. Cline
D. Darby
R. Harden
L. Kunzler
R. Summers

0280R

Brush-Wellman Inc.
Topaz Mining Property
ACT/023/003
Juab County, Utah
May 13, 1985

RULE M-3(1)-NOTICE OF INTENTIONS TO COMMENCE OPERATIONS - JRH, DD, RS

- (a) The operator has provided the location of the land but needs to provide information on the maps as to the total area affected in acres.
- (d) The applicant should submit a large scale map (i.e. USGS 7 1/2 minute quad) depicting locations of all springs, wells, stock ponds, and streams (if any) in and adjacent to the permit area.
- (f) The applicant shall supply a geologic map of the mine plan and adjacent area. All fault zones, strikes and dips of structures shall be indicated. All information submitted to DOGM will be held as confidential and not be disclosed without written approval.

The applicant shall supply a map which shows all wells and springs on and adjacent to the mine plan area. The applicant shall discuss any adverse effects mining will have on groundwater sources including a brief description of the ground water resource. The applicant shall submit geochemical analyses showing the presence and amount of any toxic and hazardous materials within each lithologic layer of overburden to be removed and stored.

- (f)&(h) The applicant shall describe any hydro-thermal activity on and adjacent to the mine plan area and discuss if mining activities will intercept hydro-thermal sources.
- (h) The applicant should submit a narrative describing the disposal or uses of any water encountered or collected in the pits. If no water is to be disposed of, the applicant should briefly describe why no disposal will occur and commit to addressing this subsection of rule M-3 if any such disposal will occur in the future. The applicant is also requested to submit the results from a water quality sample from one high grade and one low grade pit.

Rule M-3(5) - JRH

Brush Wellman has not submitted information regarding exploration to the Division since February 1, 1978. All exploratory drilling and related functions shall be included in the application under the requirements of M-3(5) and specific information related to all holes presently drilled or proposed as detailed in M-3(5)(a)thru(d).

Report form MR-9 shall also be filed with the Division for all mineral exploration work undertaken and approved within the limits of this rule. It shall not be filed in lieu of reporting requested under Rule M-8.

All holes made as step outs to an initial proposed drilling program should be described in (a) through (d) above to the Division as soon as possible. The additional information may be filed as an addendum to the original notice and will not require approval.

Rule M-3(2)(e) - LK

Final revegetation plans will be developed in conjunction with an on-going test plot program. These plans must be submitted to the Division for review and approval at least 90 days prior to any final reclamation. The plans must include a description of: the seed mix(es) and rate of application in Pure Live Seed (PLS) per acre and/or stocking rate (plants per acre) for seedlings, seeding & planting techniques (including seasons), seedbed preparation, mulching, fertilization, and irrigation (if appropriate). However, all contemporaneous or interim stabilization measures to be used in the interim should be submitted at this time.

A revegetation monitoring plan for the bond release period must be submitted. This plan should include parameters to be measured, sampling techniques and timing.

Since sheep grazing is part of the land use for the permit area, it may be necessary to fence reclaimed areas.

It appears that the only variable thus far tested in Brush Wellman's test plot program was fertilizer. Although results do not demonstrate favorable revegetation, they do show that the higher fertilizer rate was best. As a result of observations made of test plots and naturally invading plants during the April 16, 1985 site visit, the Division

feels that revegetation is feasible and that the test plots should be revised. Attached is an outline of a suggested revegetation test plot design which the Division would like to discuss with you and have implemented this year.

RULE M-5 - SURETY GUARANTEE - JRH

Under the intent of the Mined Land Reclamation rules and regulations, the operator must provide a contingency for abandonment of the mine site in the form of a Surety Guarantee as prescribed in Rule M-5.

Design, estimates and drawings for reclamation activities should be made for at least the term of the mine permit, and if possible for the life of the mine. Regardless of the expected life of the mining operations, reclamation plans and cost estimates must be provided.

In order for the Division to determine the amount of surety to be provided, the operator must first submit a complete reclamation plan. Bonding requirements for the permit will be based on the worst case conditions during the permit term. In order to determine the worst case conditions during the permit term the operator must provide sufficient plans of operations as detailed under Rule M-3. Quantities of various reclamation activities should be based on information given in Form MR-1.

The basis for the surety amount will be the quantities and the scope of work as required in the reclamation plan. In order to determine the amount required for reclamation, productivity calculations for equipment and unit costs must be determined.

Reference materials used by the Division in bond cost estimating are; the "RENTAL RATE BLUE BOOK," the "MEANS SITE WORK COST DATA" and "CATERPILLAR PERFORMANCE HANDBOOK". These documents will be the source of data for finalizing cost estimates. The Cat Book gives the productivity rates for each size of equipment manufactured by Caterpillar. The Cat Book also gives a selection of operational factors that affect machine production. Each of these adjustment factors must be considered for use in the final calculations. Likewise, the Blue Book presents the cost of renting various pieces of equipment used in the mining industry, particularly those used for earthwork in reclamation activities. These costs range from hourly to monthly costs. In addition, the hourly operation costs must be included to account for fuel consumption and maintenance costs. The Blue Book cost does not include operator costs. The Means Book is used to determine labor and operator costs. As with the Blue Book rental rates for equipment, labor costs must also be estimated at subcontractor rates

with overhead and profit included. The Means Book provides labor rates with these factors included. Additionally, inflation factors for bond estimates are derived from Means Cost Data. Inflation rates for construction during the previous three years are averaged and applied to the cost estimate as an inflation factor.

The operator may use other sources of information to determine reclamation cost. The basis or methodology used by the operator should be referenced and sufficient calculations should be provided by the operator so that a final cost estimate can be made and a fixed amount determined for the surety.

RULE M-8(2) - REPORTS - JRH

The Annual Operations and Progress Report submitted by Brush Wellman should provide the gross amount of material moved during the year as well as the disposition of such material as required under M-8(b)(2). The operator should include the total amount of overburden or waste rock mined and removed, and locate where on the site the material has been placed. The operator should submit these data and incorporate total amounts of materials into each annual report.

RULE M-10(1) Land Use - JRH

The operator must include in the reclamation plan, provisions for post-mining land use compatible with probable land uses on abandonment. Realizing the nature and the magnitude of the disturbance, the operator will need to detail specific areas for land use.

RULE M-10(2) Public Safety and Welfare - JRH

- (a) Operations at the Rainbow pit included underground mining operations. Brush Wellman should include on the site map of the Rainbow Pit, the location of the abandoned underground working. If hazardous conditions are present from underground mining, the operator should so state and offer a plan or commitment to mitigate these circumstances.
- (b) The operator needs to address the disposal of trash and debris in the mine plan. The operator should propose a plan for and commit to a disposal plan for waste materials incidental to mining and that plan should be in accordance with the Rules and Regulations of the Division of Health.
- (c) The operator has not submitted in the reclamation plan, any proposal or plans for the plugging and capping of drill, core, or other explanatory holes as set forth in Rule M-3(5).

- (e) The operator should provide information as to what safety measures are being implemented for protection above highwalls, benches and other excavations at the site during operation of the mine and upon final abandonment. Such compliance measures should be within MSHA regulations.

Rule M-10(3) Reclamation Standards - RS

The applicant should request formal approval from the Division for allowing the unreclaimed open pits to be used as water impounding facilities upon abandonment.

Rule M-10(4) Slopes - JRH

As part of the reclamation plan, the operator shall, if possible, regrade all waste piles and fills to a rounded configuration and at such slopes so as to minimize safety hazards and erosion. Such fills or waste piles need to be identified by the operator. The operator should also estimate and quantify final size and configuration of both the pits and the waste piles for at least the permit term.

Fills and waste piles should also include a description of proposed drainage control, surface erosion control, and vegetation to be used for stabilization of the slopes.

Rule M-10(4) and (11) - RS

The applicant should submit plans for control of erosion from fill slopes. Following an onsite tour of the facilities, it has been determined that these plans need not be extensive in nature. The applicant has committed to regrading of all fill slopes greater than 20% in the MR-2 submitted on February 3, 1981 in order to control erosion. As an additional option, the Division will accept a berm or ditch around the toe of such slopes in order to contain the sediment at the site. The applicant may decide which of these options they wish to implement.

Rule M-10(5) Highwalls - JRH

Reclamation standards for highwalls and open cuts consist of backfilling against or cutting back the wall to achieve a slope angle of 45 degrees or less. However, much of the open cuts at Brush Wellman are solid rock and if the operator can show sufficient design criteria, the above standards may be waived. The operator should also consider those areas above the cuts which consist of unconsolidated material that may have to be graded to achieve stability.

Rule M-10(7) Roads and Pads - JRH

The operator has provided information as to the type and procedures used for developing and maintaining roads within the permit area. Reclamation of roads and pads should be addressed in the plan. Although the expected mine life makes it difficult to determine final configuration and details, the operator should consider existing and proposed roads and pads for the permit term.

Roads and pads within the affected area should be indicated on the affected area maps.

Rule M-10(9) Structures and Equipment - JRH

The operator needs to identify and commit to demolition and removal of all structures, utility connections, equipment and debris prior to regrading and abandonment. Approval may be granted for continuing or post mining land use given sufficient justification.

Rule M-10(12) Vegetation - LK

Brush Wellman must supply a vegetation inventory of the surrounding undisturbed vegetation using professionally accepted inventory techniques. This will be used as the basis for setting revegetation success standards.

0280R

Recommendations for
REVEGETATION TEST PLOT DESIGN
Brush Wellman, Inc.
Topaz Mining Property

Treatments:

Seed mix (see appendix A) - use on all plots

Mulch - 2000 lbs/acre of hay - use on all plots

Fertilizer - 75#/ac. N, 30#/ac. P - use on all plots

Surface Treatment - all slopes should be terraced, level areas
should be pitted or gouged

Irrigation - 1/2 of plot to receive supplemental water, the
other 1/2 will receive no supplemental water

Soil Mixtures - rhyolite and clay material should be tested in
the following mixtures:

1:1 Clay:Rhyolite

1:2 Clay:Rhyolite

1:3 Clay:Rhyolite

Rhyolite alone

Fencing - all plots should be fenced

Appendix A
Recommended Seed Mix

Species*	# PLS/ac.**
<u>Grasses:</u>	
'Nezpar' Indian Rice Grass (<u>Oryzopsis hymenoides</u>)	3
'Hycrest' Crested wheat (<u>Agropyron cristatum</u> X <u>A. desertorum</u>)	3
'Piute' Orchard Grass (<u>Dactylis glomerata</u>)	1
Blue Grama (<u>Bouteloua gracilis</u>)	1
Galleta (<u>Hilaria jamesii</u>)	2
<u>Forbs:</u>	
Yellow sweet clover (<u>Melilotus officinalis</u>)	2
'Ladak' alfalfa (<u>Medicago sativa</u>)	2
Palmer penstemon (<u>Penstemon palmeri</u>)	1
Gooseberry leaf globemallow (<u>Sphaeralcea grossulariaefolia</u>)	1
<u>Shrubs:</u>	
'Rincon' 4-wing saltbush (<u>Atriplex canescens</u>)	3
Shadscale (<u>Atriplex confertifolia</u>)	3
Winterfat (<u>Ceratoides lanata</u>)	3

* Where possible, one should use certified seed. If unavailable, a current (within last 4 months) germination/viability test should be obtained.

** Rates are for broadcast seeding methods, if drill seeded, reduce by one-half.